CETIFICATION

SDG No:	JC19023	Laboratory:	Accutest, New Jersey
Site:	BMS, Building 5 Area, PR Humacao, PR	Matrix:	Soil

SUMMARY: Soil samples (Table 1) were collected on the BMSMC facility – Building 5 Area. The BMSMC facility is located in Humacao, PR. Samples were taken April 22-25, 2016 and were analyzed in Accutest Laboratory of Dayton, New Jersey for low molecular weight alcohols (LMWA):- isopropyl alcohol and sec-butyl alcohol. The results were reported under SDG No.: JC19423. Results were validated using "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8015C are utilized and the latest validation guidelines (July, 2015) of the EPA Hazardous Waste Support Section. The analyses performed are shown in Table 1. Individual data review worksheets are enclosed for each target analyte group. The data sample organic data samples summary form shows for analytes results that were qualified.

In summary the results are valid and can be used for decision taking purposes.

Table 1. Samples analyzed and analysis performed

SAMPLE ID	SAMPLE DESCRIPTION	MATRIX	ANALYSIS PERFORMED
JC19023-1R	RA-17 (17-18)	Soil	LMWA:- ISOPROPYL ALCOHOL AND SEC-BUTYL ALCOHOL
JC19023-2R	S-40S(10.5-11.5)	Soil	LMWA:- ISOPROPYL ALCOHOL AND SEC-BUTYL ALCOHOL
JC19023-3R	BPEB-6	AQ – Equipment Blank	LMWA:- ISOPROPYL ALCOHOL AND SEC-BUTYL ALCOHOL
JC19023-4R	S-39(11-12)	Soil	LMWA:- ISOPROPYL ALCOHOL AND SEC-BUTYL ALCOHOL

Reviewer Name: Rafael Infante
Chemist License 1888

Signature: Rafael Infante

Date: June 7, 2016

SGS Accutest

Report of Analysis

Client Sample ID:	RA-17 (17-18)		
Lab Sample ID:	JC19023-1R	**Date Sampled:**	04/22/16
Matrix:	SO - Soil	**Date Received:**	04/26/16
Method:	SW846-8015C (DAI)	**Percent Solids:**	72.6
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GH105136.D	1	05/20/16	XPL	n/a	n/a	GGH5293
Run #2							

	Initial Weight
Run #1	5.1 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	140	77	ug/kg	
78-92-2	sec-Butyl Alcohol	ND	140	72	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	108%		52-141%
111-27-3	Hexanol	110%		52-141%

(a) Sample analyzed outside the holding time per client's request.

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Rafael Infante Méndez
LIC # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	S-40S (10.5-11.5)		
Lab Sample ID:	JC19023-2R	**Date Sampled:**	04/22/16
Matrix:	SO - Soil	**Date Received:**	04/26/16
Method:	SW846-8015C (DAI)	**Percent Solids:**	74.6
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GH105137.D	1	05/20/16	XPL	n/a	n/a	GGH5293
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	130	77	ug/kg	
78-92-2	sec-Butyl Alcohol	ND	130	71	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	102%		52-141%
111-27-3	Hexanol	105%		52-141%

(a) Sample analyzed outside the holding time per client's request.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	BPEB-6		
Lab Sample ID:	JC19023-3R	**Date Sampled:**	04/22/16
Matrix:	AQ - Equipment Blank	**Date Received:**	04/26/16
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GH105174.D	1	05/23/16	XPL	n/a	n/a	GGH5296
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	68	ug/l	
78-92-2	sec-Butyl Alcohol	ND	100	66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	79%		56-145%
111-27-3	Hexanol	83%		56-145%

(a) Sample analyzed outside the holding time per client's request.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	S-39 (11-12)		
Lab Sample ID:	JC19023-4R	**Date Sampled:**	04/25/16
Matrix:	SO - Soil	**Date Received:**	04/26/16
Method:	SW846-8015C (DAI)	**Percent Solids:**	75.4
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GH105138.D	1	05/20/16	XPL	n/a	n/a	GGH5293
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	130	76	ug/kg	
78-92-2	sec-Butyl Alcohol	ND	130	71	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	113%		52-141%
111-27-3	Hexanol	114%		52-141%

(a) Sample analyzed outside the holding time per client's request.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SD - Foreign
SEB

SGS ACCUTEST - NJ

CHAIN OF CUSTODY

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SGS Accutest Job # JC19023

Company Name: Anderson Mulholland Assoc. Inc.	Project Name: BMS Release Assessment	
Street Address: 2700 Westchester	Street:	Billing Information (if different from Report to):
City: Purchase State: NY Zip:	City: Humacao State: PR	Company Name:
Project Contact: Terry Taylor E-mail:	Project #:	Street Address:
Phone #: 914-251-0400 Fax #:	Client Purchase Order #:	City State Zip:
Sampler(s) Name(s): N. Rivera, T. Taylor, D. Lindstrand, R. O'Reilly Phone #:	Project Manager:	Attention:

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

SGS Accutest Sample #	Field ID / Point of Collection	MEOH/H2O Vial #	Collected: Date	Collected: Time	Sampled by	Matrix	# of bottles	Number of preserved Bottles: HCl	H2SO4	HNO3	NaOH	DI Water	MEOH	ENCORE	8270 SVOC - Method 8270D	LMA - Method 8015B	Pesticides - Method 8081B	1-Methyl Naphthalene by Method 8270D SIM	LAB USE ONLY
1	RA-17 (17-18)		4/22/16	1230	TT	SO	2					2			X	X	X	X	FS
2	S-405 (10.5-11.5)		4/22/16	1231	NR	SO	2					2			X	X	X	X	1128
3	BP-EB-6	•	4/23/16	1400	TT	EB	5	3				2			X	X	X	X	1139
4	S-39 (11-12)		4/25/16	1045	TT	SO	2					2			X	X	X	X	

Turnaround Time (Business days)

- [x] Std. 10 Business Days — For Soil
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [x] 1 Day RUSH — For Aqueous
- [ ] other

Emergency & Rush T/A data available VIA Lablink

Approved By (SGS Accutest PM) / Date:

INITIAL ASESSMENT AM 4/26

LABEL VERIFICATION TM

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [x] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Deliverables Quality Protocol Reporting

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary

NJ Reduced = Results + QC Summary + Partial Raw data

- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Comments / Special Instructions

Add to Report: 1-methyl naphthalene with SVOC by Method 8270D

• 2x30 mL FOR PBT 4-26-16 AM

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by:	Date/Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	[signature]	4/25/16 1500	1 FedEx	2 FX	4-26-16 945	2 DA
3			3	4		4
5			5	Cooler Temp: 6.01	Preserved where applicable	On Ice: 8 Cooler Temp: 4.0 C IR

5.1 5

EXECUTIVE NARRATIVE

SDG No:	**JC19023R**	Laboratory:	**Accutest, New Jersey**
Analysis:	**SW846-8015C**	Number of Samples:	**4**
Location:	BMSMC, Building 5 Area Humacao, PR		

SUMMARY: Four (4) samples were analyzed for selected low molecular weight alcohols (LMWAs):- isopropyl alcohol and sec-butyl alcohols, following method SW846-8015C. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8015C are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues:	**None**
Major:	**None**
Minor:	**None**

Critical findings:	**None**
Major findings:	**1.** Sample analyzed outside the holding time per client's request. Results are qualified in affected samples: non-detects results are rejected (R).
Minor findings:	**None**

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: 

Date: June 7, 2016

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC19023-1R
Sample location: BMSMC Building 5 Area
Sampling date: 4/22/2016
Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Isopropyl Alcohol	140	ug/kg	1.0	-	R	Yes
sec-Butyl Alcohol	140	ug/kg	1.0	-	R	Yes

Sample ID: JC19023-2R
Sample location: BMSMC Building 5 Area
Sampling date: 4/22/2016
Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Isopropyl Alcohol	130	ug/kg	1.0	-	R	Yes
sec-Butyl Alcohol	130	ug/kg	1.0	-	R	Yes

Sample ID: JC19023-3R
Sample location: BMSMC Building 5 Area
Sampling date: 4/22/2016
Matrix: AQ - Equipment Blank

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Isopropyl Alcohol	100	ug/l	1.0	-	R	Yes
sec-Butyl Alcohol	100	ug/l	1.0	-	R	Yes

Sample ID: JC19023-4R
Sample location: BMSMC Building 5 Area
Sampling date: 4/25/2016
Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Isopropyl Alcohol	130	ug/kg	1.0	-	R	Yes
sec-Butyl Alcohol	130	ug/kg	1.0	-	R	Yes

Project Number:___JC19023R____________
Date:___________04/22-25/2016________
Shipping Date:____04/25/2016____________
EPA Region:________2________________

REVIEW OF VOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1023R)," specifically for Methods 8000/8015C are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_________________ data package received has been reviewed and the quality control and performance data summarized. The modified data review for VOCs included:

Lab. Project/SDG No.: __JC19023R________________ Sample matrix: ________Soil___________
No. of Samples: _________4___________________

Trip blank No.: _______-____
Field blank No.: _______-____
Equipment blank No.:___JC19023-3R____
Field duplicate No.:_____-____

___X___ Data Completeness
___X___ Holding Times
___N/A_ GC/MS Tuning
___N/A_ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_Selected_low_molecular_weight_alcohols_by_SW-846_8015C________________
____

Definition of Qualifiers:
J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer: Rafael Infante
Date:__June_7,_2016_________________________________

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met _____
Criteria were not met
and/or see below __X__

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pH	ACTION
Samples analyzed outside the holding time per client request. All samples properly preserved.				
JC19023-1R	04/22/16	05/20/16	-	Sample results qualified: positive results are qualified estimated (J); non-detects are rejected (R).
JC19023-2R	04/22/16	05/20/16	-	
JC19023-3R	04/22/16	05/23/16	-	
JC19023-4R	04/25/16	05/20/16		

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH $\leq$ 2, 4°C), no air bubbles.
Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.
Soil samples- 7 days from sample collection.
Cooler temperature (Criteria: 4 $\pm$ 2 °C): 4.4°C

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).
If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)
If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).
If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).
If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).
If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).
If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were met __N/A__
Criteria were not met see below ____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

__N/A_ The BFB performance results were reviewed and found to be within the specified criteria.

__N/A_ BFB tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

List the samples affected: _____

If mass calibration is in error, all associated data are rejected.

All criteria were met __X__
Criteria were not met
and/or see below _____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____05/17/16_____
Dates of initial calibration verification:__05/17/16_____
Dates of continuing calibration verification:_05/20/16;_05/23/16_____
Dates of final calibration verification:_____05/20/16;_05/23/16_____
Instrument ID number:_____GCGH_____
Matrix/Level:_____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED

Note: Initial, continuing, and final calibration verifications meets method specific requirements in the two columns.

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.
All %RSD must be ≤ 15 % regardless of method requirements for CCC.
All %Ds must be ≤ 20% regardless of method requirements for CCC.
It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of ≥ 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.
If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.
If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).
If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has r < 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were met __X__
Criteria were not met
and/or see below _____

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
All_method_blank_meeth_method_specific_criteria				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS

_No_target_analytes_detected_in_the_equipment_blank._equipment_No_field/trip_blanks_included_in_ _this_data_package.

All criteria were met __X__
Criteria were not met
and/or see below _____

V B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)
ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and ≤ AL, report the compound as not detected (U) at the SQL.
If the concentration is ≥ SQL but ≤ AL, report the compound as not detected (U) at the reported concentration.
If the concentration is ≥ SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately
Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met ___X___
Criteria were not met
and/or see below _____

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.
List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.
Matrix: solid/aqueous

SAMPLE ID	SURROGATE COMPOUND				ACTION
	Hexanol	~~DBFM~~	~~TOL-d8~~	~~BFB~~	

_All_surrogate_recoveries_within_laboratory_control_limits._____

QC Limits* (Aqueous)
_____LL_to_UL___ _73_to_123_ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Low)
_____LL_to_UL___ _52_to_141__ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Med)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____

1,2-DCA = 1,2-Dichloromethane-d4 TOL-d8 = Toluene-d8
DBFM = Dibromofluoromethane BFB = Bromofluorobenzene

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 80 – 120 % for aqueous and 70 – 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.
If any one surrogate in a fraction shows < 10 % recovery.

All criteria were met __X___
Criteria were not met
and/or see below _____

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JC20528-1AMS/-MSD_____ Matrix/Level:_____Soil_____
Sample ID:__JC20768-1MS/-MSD_____ Matrix/Level:_____Aqueous_____

MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION
MS/MSD%_recoveries_and_RPD_within_laboratory_control_limits					

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

All criteria were met __X__
Criteria were not met
and/or see below ____

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD – Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:_____-_____ Matrix/Level/Unit:_____-_____

COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

* If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).
* If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? **Yes** or No. If no make note in data review memo.
List the %R of compounds which do not meet the criteria

LCS ID	COMPOUND	% R	QC LIMIT

___Recoveries_within_laboratory_control_limits_____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).
If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met ___N/A___
Criteria were not met
and/or see below _____

IX. FIELD/LABORATORY DUPLICATE PRECISION

Sample IDs: _____-_____ Matrix:_____-_____

Field/laboratory duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: RPD ± 30% for aqueous samples, RPD ± 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
No field/laboratory duplicate analyzed with this data package. MS/MSD recoveries RPD used to assess precision. RPD within laboratory and generally acceptable control limits.					

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met __N/A__
Criteria were not met
and/or see below ____

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

* Area of +100% or -50% of the IS area in the associated calibration standard.
* Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO – 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

2. If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JC19023R-1R Hexanol RF = 67.60

[ ] = (371643)/(67.60)

= 5,498 ppm OK

All criteria were met __X__
Criteria were not met
and/or see below ____

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

B. Percent Solids

List samples which have ≤ 50 % solids

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R)